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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,406	12/07/2001	Paul L. Sinclair	NCR 10031and 10033	1552

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EXAMINER	
NGUYEN, CINDY	

ART UNIT	PAPER NUMBER
2171	

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,406	SINCLAIR ET AL.	
	Examiner	Art Unit	
	Cindy Nguyen	2171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-12,14-21, 23-27,29-37, 39-43,45-49, 51 and 53* is/are rejected.

7)☒ Claim(s) *7,13,22,28,38,44,50 and 52* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This is in response to communication filed 06/22/04.

1. Response to Arguments

Applicant's arguments have been considered and found persuasive. Hence, the finality of the last office action, mailed 06/26/04, is hereby withdrawn. However, upon reconsideration and a search update, the examiner reaches conclusions discussed below.

2. Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as incomplete because the linkage between the claimed "partition managements component" and the other claimed structural components is missing. In other words, it is not clear from the claim what the "partition management component" is connected to.

3. Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-6, 12, 14, 15, 17-21, 27, 29, 30, 32-37, 43, 45, 46, 48, 49 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. (U.S 6223182) (Agarwal) in view of Garth et al. (U.S 6678701) (Garth).

Regarding claims 1, 17, 32 and 48, Agarwal discloses a database system and a method for reorganizing rows from a partitioned database table, the partitioned database table including a plurality of populated partitions, comprising the steps of:

a. organizing rows in each of the populated partitions in accordance with a first value associated with each row(col. 11, lines 52-63, Agarwal);

b. creating a file context (partition table 1000) for each partition of a subset of the populated partitions (col. 12, lines 28-45, Agarwal).

c. merging rows from the subset of partitions into a single first-merge partition in order of the first value associated with each row (col. 9, lines 50-56, Agarwal);

d. repeating steps b through c until the subsets have included all populated partitions (col. 9, lines 65 to col. 10, lines 7 and col. 12, lines 28-45, Agarwal).

However, Agarwal didn't disclose: each file context storing at least location data for a row in the partition and the first value associated with the row. On the other hand, Garth discloses: each file context storing at least location data for a row in the partition and the first value associated with the row (col. 5, lines 32-46, Garth). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include file context storing at least location data for a row in the partition and the first value associated with the row in the system of Agarwal as taught by Garth. The motivation being to enable system stores data into a separate part of the database, and stores a row at a particular location in the database with a row identifier used to build indexes on the database (col. 5, lines 32-46, Garth).

In addition, Agarwal/Garth discloses: one or more nodes (104, fig. 1 and corresponding text, Agarwal); a plurality of CPUs (104, 106, fig. 1, Garth), each of the one or more nodes

(loading system) providing access to one or more CPUs (col. 4, lines 56-67, Garth); a plurality of virtual processes , each of one or more CPUs providing access to one or more virtual processes (300, 302, 304, 306, fig. 3, Garth); each virtual process configured to manage data, including rows from the partitioned database table (col. 5, lines 32-46 Garth), stored in one of a plurality of data storage facilities (320, 322, 324, 326, fig. 3, Garth). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include more then one, CPUs and more then one processes in the system of Agarwal as taught by Garth. The motivation being to enable system provided the users access on multiple processors concurrently, parallel processing exploits the multiprocessor capabilities of modern high speed computers and refers to the use of several processors to access data into different parts of the database in parallel with each other.

In addition, Agarwal/Garth discloses: a partition merging component configured to reorganize rows from the portioned database table in each data storage facility (col. 12, lines 12-45, Agarwal).

Regarding claims 2, 18 and 33, all the limitations of these claims have been noted in the rejection of claims 1, 17 and 32 above, respectively. In addition, Agarwal/Garth discloses: further comprising the step of: e. comparing a specified grouping limit to the number of first-merge partitions and merging the first-merge partitions if the specified grouping limit is less than the number (col. 8, lines 37-53, Agarwal).

Regarding claims 3, 19 and 34, all the limitations of these claims have been noted in the rejection of claims 1, 17 and 32 above, respectively. In addition, Agarwal/Garth discloses:

wherein the location data for a row is the location of a block of rows that includes the row (col. 11, lines 52-63, Agarwal).

Regarding claims 4, 35 and 49, all the limitations of these claims have been noted in the rejection of claims 1, 33 and 48 above, respectively. In addition, Agarwal/Garth discloses: wherein steps a through c are performed on rows in a single data-storage facility (col. 5, lines 53-57, Agarwal).

Regarding claims 5, 20 and 36, all the limitations of these claims have been noted in the rejection of claims 1, 17 and 32 above, respectively. In addition, Agarwal/Garth discloses: wherein the file contexts are stored in memory (col. 11, lines 2-18, Agarwal).

Regarding claims 6, 21 and 37, all the limitations of these claims have been noted in the rejection of claims 1, 17 and 32 above, respectively. In addition, Agarwal/Garth discloses: wherein the rows of the first-merge partitions are stored separately from the rows of the populated partitions of the partitioned database table (col. 11, lines 64 to col. 12, lines 2, Agarwal).

Regarding claims 12, 27, 43 and 51, all the limitations of these claims have been noted in the rejection of claims 1, 17, 32 and 48 above, respectively. In addition, Agarwal/Garth discloses: wherein the subsets of partitions contain no more than a specified number of populated partitions and the specified. number is determined by memory usage (col. 8, lines 37-53, Agarwal).

Regarding claims 14, 29 and 45, all the limitations of these claims have been noted in the rejection of claims 1, 32 and 48 above, respectively. In addition, Agarwal/Garth discloses: wherein the reorganization is conducted in response to a query having conditions and the step of

merging rows includes eliminating rows that do not satisfy the query conditions (col. 13, lines 21-30, Agarwal).

Regarding claims 15, 30 and 46, all the limitations of these claims have been noted in the rejection of claims 1, 32 and 48 above, respectively. In addition, Agarwal/Garth discloses: wherein the first subset of the populated partitions includes all the populated partitions and steps b and c are not repeated (col. 9, lines 65 to col. 10, lines 7, Agarwal).

5. Claims 8-11, 16, 23-26, 31, 39-42, 47 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. (U.S 6223182) (Agarwal) in view of Garth et al. (U.S 6678701) (Garth) and further in view of Goetz Graefe, "Query Evolution techniques for large databases", ACM computing surveys, Vol. 25, No. 2, June 1993.

Regarding claims 11, 26, 39 and 42, all the limitations of these claims have been noted in the rejection of claims 1, 17, 32 and 48 above, respectively. In addition, Agarwal/Garth discloses: further comprising the steps of:

e. creating a file context for each first-merge partition of a subset of the first-merge partitions, each file context storing at least location data for a row in the partition and the first value associated with the row (col. 6, lines 12-19, Agarwal);

f. merging rows from the subset of first-merge partitions into a spool-merge partition in order of the first value associated with each row (col. 9, lines 50-56, Agarwal);

g. repeating steps a and f until the subsets have included all first-merge partitions (col. 9, lines 65 to col. 10, lines 7, Agarwal);

However, Agarwal/Garth didn't disclose: the steps of h, I and j. On the other hand, Graefe discloses: h. bypassing steps i through k if the rows from the populated partitions are

contained in one partition in order of the first value associated with each row (fig. 6 and page 88, Graefe);

i. creating a file context for each spool-merge partition of a subset of the spool-merge partitions, each file context storing at least location data for a row in the partition and the first value associated with the row (fig. 6 and page 88, Graefe);

j. merging rows from the subset of spool-merge partitions into a new spool-merge partition in order of the first value associated with each row;

k. repeating steps i and j until the rows from the populated partitions are contained in one partition in order of the first value associated with each row (fig. 6 and page 88, Graefe). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include the steps for creating a file context for each spool-merge partition of a subset of the spool-merge partitions then merging rows from the subset of spool-merge partitions into a new spool-merge partition in order and then repeat these steps in the system of Agarwal as taught by Graefe. The motivation being to enable the system operates the merge-join for the input as first merge step only part of the all table are combined and runs the result then merged with other cost for the just the right number of runs after the end of the input file has been reached and to always merge the smallest runs available for merging (page 88, Graefe).

Regarding claims 8 and 23, all the limitations of these claims have been noted in the rejection of claims 11 and 26 above, respectively. In addition, Agarwal/Graefe discloses: wherein the specified grouping limit is 1 (col. 9, lines 65 to col. 10, lines 7, Agarwal).

Regarding claims 9, 24 and 40, all the limitations of these claims have been noted in the rejection of claims 8, 23 and 39 above, respectively. In addition, Agarwal/Graefe discloses:

wherein first-merge partitions and spool-merge partitions are contained in different subtables of a spool (col. 11, lines 1-18, Agarwal).

Regarding claims 10, 25 and 41, all the limitations of these claims have been noted in the rejection of claims 8, 23 and 39 above, respectively. In addition, Agarwal/Graefe discloses: wherein step j includes merging rows from the subset of spool-merge partitions, each located in a first subtable of a spool, into a new spool-merge partition, located in a second subtable of the spool (col. 11, lines 18-37, Agarwal).

Regarding claims 16, 31, 47 and 53, all the limitations of these claims have been noted in the rejection of claims 1, 17, 32 and 48 above, respectively. In addition, Agarwal/ Graefe discloses: wherein the first value is the result of a hash function applied to one or more values in one or more columns of the associated row (page 90, left col., 2nd paragraph, Graefe).

6. Allowable Subject Matter

Claims 7, 13, 22, 28, 38, 44, 50 and 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 7, 22, 38 and 50, all the limitations of these claims have been noted in the rejection of claims 1, 17, 32 and 48 above, respectively. In addition, Agarwal/Garth discloses: further comprising the steps of:

a'. determining whether rows from a partitioned primary index table are being spooled (col. 11, lines 1-38, Agarwal);

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record and that encountered while searching for the claimed invention fails to

anticipate and/or suggest a database system and method for reorganizing rows from a partitioned database table, the portioned database table including a plurality of populated partitions comprising the steps determining whether a subsequent operation requires the spooled rows to be ordered in accordance with the first value associated with each row and performing steps b through d only if both determinations, a' and a", are true as recited in claim 2, 22, 38 and 50.

The prior art of record and that encountered while searching for the claimed invention fails to anticipate and/or suggest a database system and method for reorganizing rows from a partitioned database table, the portioned database table including a plurality of populated partitions comprising the steps of calculating the cost of reorganizing rows from a partitioned database table using the equation cost as recited in claims 13, 28, 44 and 52.

7. Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wolf et al. (U.S 5765146). Method of performing a parallel relational database query in a multiprocessor environment.

Dias et al. (U.S 5121494). Joining two database relations on a common field in a parallel relational database field.

8. Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy Nguyen whose telephone number is 703-305-4698. The examiner can normally be reached on M-F: 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 703-308-1436. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7240 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

CN

Cindy Nguyen
August 27, 2004

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